

## ПРОБЛЕМЫ ГЕОЛОГИИ И ОСВОЕНИЯ НЕДР

Similar pairs can be given for nouns and adjectives: for example, *helical* – спираль / винтовой; *acid* – кислота / кислотный, кислый; *sensing* – индикация, считывание / чувствительный; *cellar* – шурф, шахта / ячеистый; *patent* – патент, открытый, очевидный, and etc.

It should be noted that the amount of words produced by functional shift of nouns – verbs and nouns – adjectives are roughly the same in petroleum industry terms.

It is proved that there are a lot of words produced by stem composition in petroleum industry terms (for example, *air-tight* – воздухонепроницаемый / герметичный; *man-shift* – человеко-смена; *red-hot* – нагретый докрасна; *salt-bearing* – соленосный; *pipe-scraper* – механический скребок для чистки труб; *sandblaster* – пескоструйный аппарат, and etc [4].

In addition, it should tell that there are reductions in petroleum industry terms. The reduction can be illustrated such examples as *bun* (from *abundant* – распространенный); *vise* (from *viscosity* – вязкость); *base* (from *basement* – подстилающая порода); *nip* (from *nipple* – ниппель); *pav* (from *paving* – прокладка дороги); *kid* (from *killed* – заглушенная (о фонтанирующей скважине); *samp* (from *sample* – проба, образец), and etc.

Therefore, have investigated the ways of nomination in petroleum industry terms, we come to conclusion that the reduction is one of the most productive ways of nomination. It can be explained by an increase of reduced items in scientific and technical terminology, because there is a lot of information in petroleum industry, and it is a short of time to pass it.

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### ACADEMIC EXCHANGE AS PHENOMENON OF GLOBALIZATION IN PETROLEUM ENGINEERING EDUCATION (EVIDENCE FROM TPU)

E.A. Purlats, A.Y. Ekkert

Scientific advisor - associate professor N.Yu. Gutareva  
*National Research Tomsk Polytechnic University, Tomsk, Russia*

#### General definition of globalization

Globalization is the process related to increasing importance of interconnection between social events and relations around the world. In this way the term of globalization appeared in the Webster dictionary in 1961 [2].

It is considered that the term "globalization" was introduced into business and scientific vocabulary by Theodore Levitt in 1983. According to his statement, "there are two vectors shaping the world - technology and globalization. The first helps determine human preferences; the second, economic realities" [4].

The beginning of the XXI century is characterized by the intensification of globalization processes in all spheres of life of the world community and our country. The Great Russian Encyclopedia presents the following definition of globalization: "Globalization is a modern stage of internationalization of global affairs, economic, political and socio – cultural processes, characterized by distinct intensity" [1].

#### Globalization in modern education

Globalization has reflected in all spheres of industry and provision of services, it has a significant impact on education, especially by means of modern information resources and communication technologies. One of globalization phenomena is the academic mobility of students.

#### Academic mobility

The purpose of our work is to analyze the specific character of the academic exchange program, the main problems of its implementation in TPU. In pursuance of the purpose it is necessary to compare the programs of other universities and offer possible solution to relevant problems.

There are more than 50 universities in Russia providing education in Petroleum engineering, but only 9 of them carry out academic exchange programs in this field [5].

In Tomsk Polytechnic University the first trips of students abroad for training were organized in the 2000s. Currently, the Department has bilateral agreements with 72 universities in 22 countries; it actively cooperates with European and Russian universities in the framework of Erasmus Mundus programs [3].

At the moment, TPU has a bilateral agreement with 3 countries, universities which provide students with education in the sphere of Oil and Gas business – the Czech Republic, Norway and India. It is difficult to say that the entire work of the Center of international educational programs comprises a lot of options. We will attempt to identify the key reasons for such limited circumstances.

First of all, it is necessary to reveal benefits of exchange programs for students.

International mobility is an important tool for high-quality training of specialists, which provides them with the opportunity to take a competitive advantage in the labor market. Today, science and technology are rapidly developing, new specialties are appearing, and international partnerships are expanding. International academic mobility programs are of great

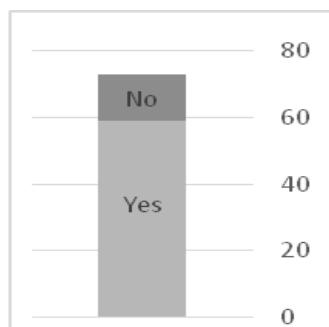
**СЕКЦИЯ 19. ГЕОЛОГИЯ, ГОРНОЕ И НЕФТЕГАЗОВОЕ ДЕЛО. ПОДСЕКЦИЯ 1.  
ПРОБЛЕМЫ МЕЖЪЯЗЫКОВОЙ ПРОФЕССИОНАЛЬНОЙ КОММУНИКАЦИИ  
В УСЛОВИЯХ ГЛОБАЛИЗАЦИИ**

importance in terms of gaining experience in studying at foreign universities, improving professional competence, mastery of foreign language, as well as formation of skills connected with intercultural and interpersonal communication.

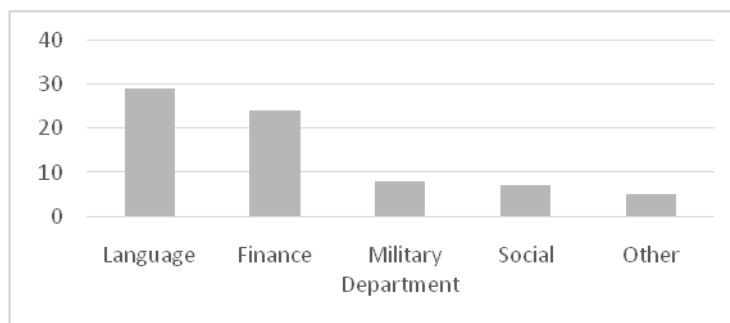
These advantages should attract students; therefore, we decided to take an opinion poll related to the attitude of students to academic exchange programs. The survey involved the answers of 773 second-year students of TPU from the School of Earth Sciences and Engineering; the following questions had been asked:

1. Would you like to participate in academic exchange?
2. Do you plan to participate in exchange program, if not, why?

The survey (Figure 1) demonstrates that more than 80 % students are interested in the program, they consider participation in such programs as an attractive challenge, some of them plan to participate, but most of students do not have this opportunity. It is important to highlight the main reasons for it.



**Fig.1 Desire to participate**



**Fig.2 Problems**

According to the survey results (Figure 2), the main difficulties can be divided into financial, psychological, communication, family and social.

Financial conditions are one of the most major problems, because, for example, the Norwegian University of science and technology requires a non-recurrent transfer of funds on its account. Although money will be recovered on arrival, not all students can afford to have such funds. Another important aspect is the scholarship. It is awarded if the rating of the partner University is higher than TPU. At Norwegian University scholarship is provided, in the other two universities-partners there is no such an opportunity due to the low rating.

Psychological barriers and difficulties are associated with such aspects of student life as homesickness or fear of the new social environment. During training, students usually face the fact that they do not know the educational systems of other countries, the difference in the structure of curricula, the time of examination sessions.

Social and family difficulties are usually associated with problems in communication with family and friends. Among the respondents there are students who are married, thus, it would be quite difficult for them to experience separation for six months. Moreover, according to their opinion, it will be difficult to live in a foreign country, away from friends.

The communicative aspect is the main problem according to the survey results. It can be related to the foreign language itself, as well as, everything associated with communication, with oral practice. The decrease in educational literature comprehensibility, culture shock, foreign mentality should also be mentioned. The necessary condition for participation in the academic exchange is the certificate that confirms the level of English. Undoubtedly, a student with a high level of foreign language does not have problems with obtaining a certificate, but the preparation for English language examination is time-consuming. TPU provides an opportunity to obtain the free certificate; it offers a number of courses for training. However, some universities (Norway) require certificates of international level (IELTS or TOEFL).

Specific difficulties are crucial for students participating in academic mobility programs with the use of a credit system limited to a certain amount. A student cannot substitute all disciplines of the TPU curriculum, he chooses the most important subjects, and the remaining courses should be studied independently. However, due to limited credits, he can not substitute all specialized disciplines. This problem was noticed by a small number of respondents interested in the exchange (about 15%). For example, Technical University of Ostrava in Poland has the Department of Mining and Geology, which is one of the three options for the exchange programs. Students have to study both basic and specialized disciplines independently there, without support of its lecturers.

### **Solution**

The lack of foreign language mastery is the main challenge for students, they spend little time on this discipline, they show interest in improving the level of English only in senior courses, which is often too late for academic mobility in our specialty. To involve first-year students in mobility programs is a very important task. Tomsk Polytechnic University gives you the opportunity to sign up for the elective course aimed at preparation for the English language examination only in the second year. In order to solve the problem it would be more efficient to involve first-year students, as well.

Next problem is the financial aspect, which, in our opinion, can be solved by the introduction of scholarship competition on a regular basis, as it is carried out in Norway in 2019 by the Ministries of education from the Russian Federation and Norway. Furthermore, cooperation with foreign universities that are in high positions in the ranking list, the universities that are already included in the mobility program is also a great opportunity:

Table 1

*Collaborating universities*

	Delft University of Technology	Montanuniversität Leoben	IFP Training	Norwegian University of Science and Technology	Technická Univerzita Ostrava
Saint Petersburg Mining University		+	+		
Ufa State Oil Technological University	+				+
Gubkin Russian University of Oil and Gas	+	+	+	+	
Far Eastern Federal University				+	
Tomsk Polytechnic University	+			+	+

The table (Table 1) shows the current situation of cooperation between Russian universities and universities of other countries. It is necessary to pay attention to a small number of possible partner universities; firstly, some countries, such as England provide educational services on a commercial basis, and cooperation with them is hardly possible for the majority of students. Secondly, another factor is the low demand for specialists in petroleum engineering field: although European oil companies are the main players in the oil market, in most countries oil and gas are not produced. In spite of the sufficient number of partner universities, in comparison with other educational institutions, TPU can conclude an agreement with IFP and University of Leoben by the example of other universities.

Analyzing personal reasons for avoiding participation in academic exchange, attention should be paid to the Military Training Department, as well. Students attending classes at the Military Training Department will not be able to go abroad to study for a semester. However, like other students, they have the opportunity to use the program while studying for a master's degree. This option is the most optimal in all cases with the appropriate exchange program.

In addition, students of junior courses, with proper knowledge of the language have a wide range of choice due to several reasons: they don't study specialized disciplines. Besides, there are no classes at Military Training Department for them. Some basic disciplines as mathematics and physics are taught in every foreign university.

In conclusion, it should be mentioned that the Center of international educational programs of Tomsk Polytechnic University is one of the best in Russia. At the moment, it is difficult to exchange with partner universities due to a number of reasons, the main of which is the lack of foreign language skills and the lack of financial assistance. TPU could start cooperating with foreign universities with which other educational institutions, like the Mining University or RSU OG interact. However, the matter is not in the number of university partners. The fact is that students do not have opportunities for participation in academic exchange programs because of the reasons given above. However, these barriers are considered to be overcome due to the globalization of international relations and their expansion; attracting financial resources of partner countries, as well as increasing the interest of students in exchange programs.

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